Influence of injection and ignition of CNG fuelled direct injection engine at constant speed

ABSTRACT

This paper presents an experimental result of engine performance and exhaust gases concentration at various ignition and injection timing for high compression engine fuelled with compressed natural gas (CNG) engine. The engine implements central direct injection (DI) method. All injectors are positioned within a certain degrees of spark plug. It is called as CNGDI engine. The objective of this experiment is to study the influence of injection and ignition towards brake torque, brake power and emission at maximum brake torque (MBT) interval. The experimental tests were carried out using computer-controlled eddy-current dynamometer which measures the CNGDI engine performance. The Horiba analyzer uses infra-red for CO, CO2, HC and flame ionization for THC for emission measurement. A closed loop wide band lambda sensor has been mounted at the exhaust manifold to indicate the oxygen level during the exercise. The emission concentration level was recorded with respects to engine speed, ignition timing and injection timing. Indicated power and torque of CNGDI engine were also monitored during the course.

Keyword: Compressed natural gas; High compression engine; CNGDI engine; Ignition timing; Exhaust emission of CNGDI engine; Direct injection MBT of CNGDI